ELECTRONIC FRONTIER FOUNDATION eff.org

Cryptography Law

BSidesMSP

Nate Cardozo, EFF

783A 8CC4 166D 1768 4E8E DAFD 2D76 4786 4AE6 3181


WILSHIRE
SAFE & SCALE CO.
SAN FRANCISCO.

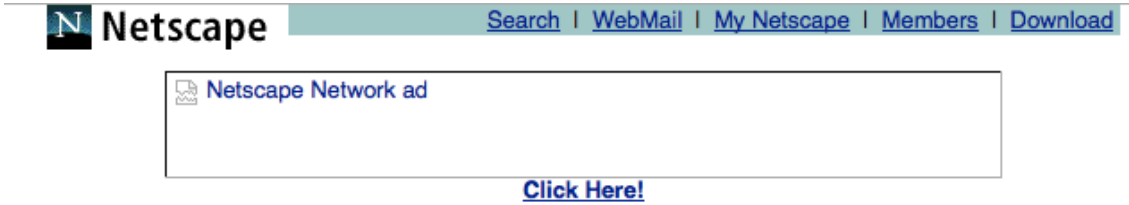
"*The Net interprets censorship as damage and routes around it.*"

John Gilmore, ~1993

The First Crypto Wars

```
#!/usr/local/bin/perl -s do
'bigint.pl';($_,$n)=@ARGV;s/^.(..)*$/0$&/;($k=unpack('B*',pack('H*',$_)))=~
s/^0*//;$x=0;$z=$n=~s/./$x=&badd(&bmul($x,16),hex$&)/ge;while(read(STDIN,$_,$w
=((2*$d-1+$z)&~1)/2)){$r=1;$_=substr($_."\0"x$w,$c=0,$w);s/.|\n/$c=&badd(&bmul
($c,256),ord$&)/ge;$_=$k;s/./$r=&bmod(&bmul($r,$r),$x),$&?$r=&bmod(&bmul($r,$c
),$x):0,""/ge;($r,$t)=&bdiv($r,256),$_=pack(C,$t).$_ while$w--+1-2*$d;print}
```

The First Crypto Wars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English, 56-bit standard encryption, including Navigator
Full Download of Communicator 4.61
If you're new to Communicator, choose either the Windows 95/98/NT or Mac PowerPC (OS 7.6.1 or later) version.
Fast Update for Communicator 4.0 Users
If you're using Communicator or Navigator 4.04 or higher (4.05 for Mac), use SmartUpdate to update to Communicator 4.61.
Full Download of Unix, International, & 128-bit
If you're looking for a Unix, International, 128-bit strong encryption, or other version of Communicator, choose from our directory.
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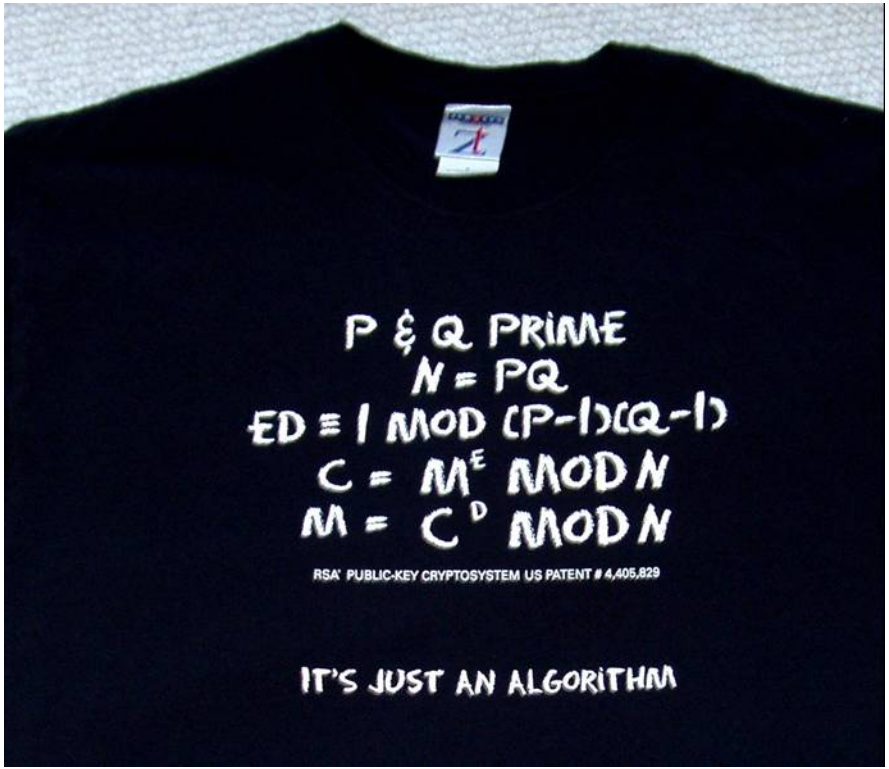
P & Q PRIME
N = PQ
ED ≡ 1 MOD (P-1)(Q-1)
C = M^E MOD N
M = C^D MOD N
RSA' PUBLIC-KEY CRYPTOSYSTEM US PATENT # 4,405,829
IT'S JUST AN ALGORITHM

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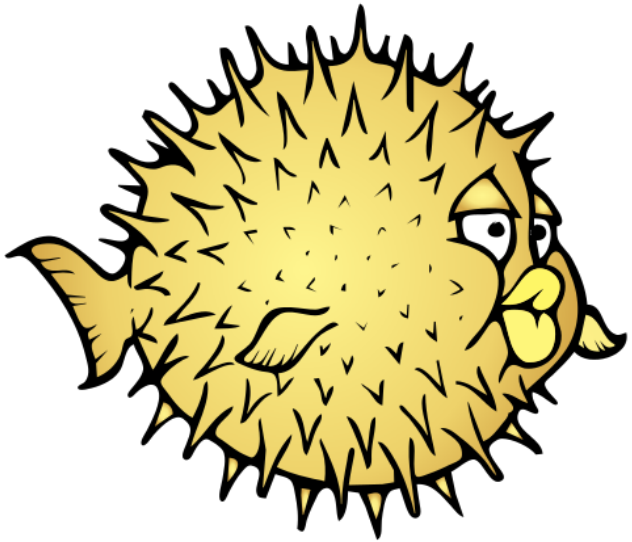


OpenBSD


WWW.SEALANDGOV.COM
WWW.HAVENCO.COM
SEALAND

If all you have is a hammer…

If all you have is a J.D. ...

Daniel J. BERNSTEIN, Plaintiff,

v.

UNITED STATES DEPARTMENT OF STATE, et al., Defendants.

No. C–95–0582 MHP.

United States District Court,
N.D. California.

April 15, 1996.

Mathematician sought declaratory and injunctive relief against enforcement of the Arms Export Control Act (AECA) and the International Traffic in Arms Regulations (ITAR) on the grounds that they were unconstitutional on their face and as applied to mathematician's cryptographic computer source code. On government's motion to dismiss for lack of justiciability, the District Court, Patel, J., held that: (1) cryptographic computer source code is "speech" protected by First Amendment, and (2) colorable constitutional challenges to statute and regulations were justiciable.

how to make the encryption algorithm (the idea) functional. U.S.C.A. Const.Amend. 1.

See publication Words and Phrases for other judicial constructions and definitions.

3. Federal Civil Procedure ⇐1773

Motion to dismiss will be denied unless it appears that plaintiff can prove no set of facts which would entitle him or her to relief. Fed.Rules Civ.Proc.Rule 12(b)(6), 28 U.S.C.A.

4. Federal Civil Procedure ⇐1829, 1835

On motion to dismiss, all material allegations in complaint will be taken as true and construed in light most favorable to plaintiff. Fed.Rules Civ.Proc.Rule 12(b)(6), 28 U.S.C.A.

5. Federal Civil Procedure ⇐1832

Although, on motion to dismiss, court is generally confined to consideration of allegations in the pleadings, when complaint is accompanied by attached documents, such documents are deemed part of the complaint and may be considered in evaluating merits of motion. Fed.Rules Civ.Proc.Rule 12(b)(6),

Code is Speech

- *Bernstein v. Department of Justice:*

"The availability and use of secure encryption may … reclaim some portion of the privacy we have lost. Gov't efforts to control encryption thus may well implicate not only the First Amendment rights … but also the constitutional rights of each of us as potential recipients of encryption's bounty."

Clipper Chip

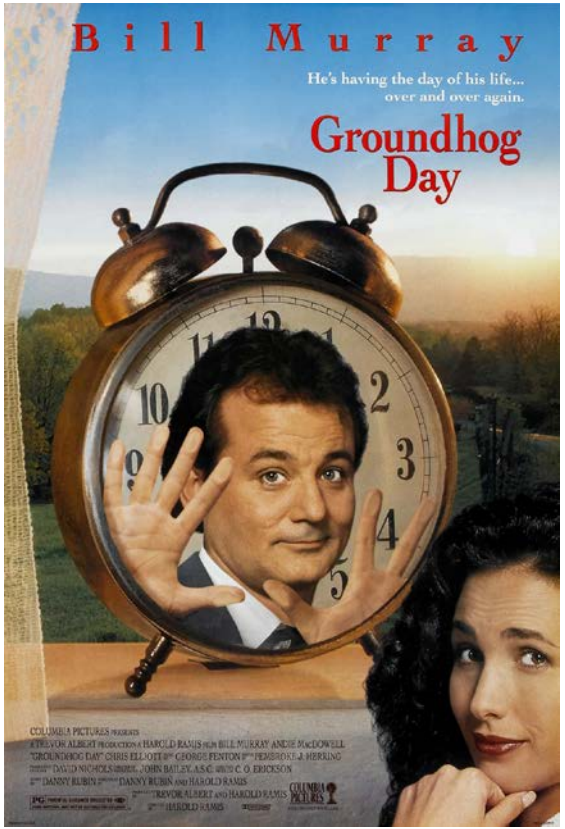
- Clipper chip was an NSA developed chipset
  - For voice comms
- Used Skipjack encryption algorithm
- Included back door with key escrow

And the Internet was a safer place for it!

- We thought we had solved the field…

- We thought we had solved the field…
  - But thanks to Comey

- We thought we had solved the field…
  - But thanks to Comey
  - More work remains


Bill Murray
He's having the day of his life...
over and over again.
Groundhog Day
COLUMBIA PICTURES presents
A TREVOR ALBERT production A HAROLD RAMIS film BILL MURRAY ANDIE MacDOWELL
"GROUNDHOG DAY" CHRIS ELLIOTT GEORGE FENTON PEMBROKE J. HERRING
DAVID NICHOLS ASHOK JOHN BAILEY, A.S.C. C. O. ERICKSON
DANNY RUBIN DANNY RUBIN AND HAROLD RAMIS
TREVOR ALBERT AND HAROLD RAMIS
HAROLD RAMIS
PG
COLUMBIA PICTURES

- FBI Director Freeh in 1997:

"[W]e're in **favor of strong encryption**, robust encryption. The country needs it, industry needs it. We just want to make sure **we have a trap door and key** under some judge's authority where we can get there if somebody is planning a crime."

The Next Crypto Wars

iOS Security

October 2014

- FBI Director Comey in 2014:

"We also need a regulatory or legislative fix to create a level playing field, so that all communication service providers are held to the same standard and so that those of us in law enforcement, national security, and public safety can continue to do the job…"

2015

- Conversation started with device encryption, but quickly moved to end-to-end encryption.
- UK PM Cameron: “Are we going to allow a **means of communications** which it simply isn't possible to read?”

“Only a Business Model”

- Government have been downplaying corporate support for encryption
  - Comey: “plenty of companies” can read users' data and unlock encrypted phones.
  - “Encryption isn’t just a technical feature; it’s a marketing pitch”
- Combined with backroom pressure

“Secure Back Door” Proposals

- Most common is some variation on key escrow
- E.g. Message sent with symmetric key
- Encrypt symmetric key twice
  - Recipient’s public key and
  - Escrow agent’s public key

For more see *Keys Under Doormats*, https://dspace.mit.edu/bitstream/handle/1721.1/97690/MIT-CSAIL-TR-2015-026.pdf

What if we re-named back doors?

- Comey: “We aren’t seeking a **back-door** approach. We want to use the **front door**”
- Washington Post “a **back door** can and will be exploited by bad guys, too. However, with all their wizardry, perhaps Apple and Google could invent a kind of **secure golden key**”


NSLs ARE MAGiC!

Legislation

- Many countries around the world are considering legislation that would either
  - mandate backdoors,
  - mandate access to plaintext or
  - endanger encryption.

UK Snooper's Charter

- Purports to regulate telecommunications operators all around the world
- § 189(4)(c): Operators may be obligated to remove "electronic protection" if they provided
  - Could be interpreted to require weakening encryption, holding a key or banning end-to-end

UK Snooper's Charter

- Latest version resented to Parliament in November
  - Currently in committee, which is accepting evidence.
  - Industry and civil society submitted comments

Australia's Defence Trade Controls Act

- Prohibits the "intangible supply" of encryption technologies.
- Many ordinary teaching and research activities could be subject to unclear export controls with severe penalties.
- International Association for Cryptologic Research organized petition against, signed 100s of experts

India Considers An Encryption Policy

- In September, India released a draft National Encryption Policy
  - Everyone required to store plain text
  - Info kept for 90 days
  - Made available to law enforcement agencies as and when demanded
- Withdrawn after criticism

China’s Anti-Terrorism Law

- Passed last year
- Draft version required tech companies to hand over **encryption codes**
- Final version: “shall provide technical interfaces, **decryption** and other technical support”

Trans-Pacific Partnership

- Some report that TPP could contain good news on encryption?
  - Alas, no.
- Provider may not be compelled to give key
  - Only “as a condition of sale”
- But provider must still give decrypted content
- TPP still has huge problems throughout

Obama: No Backdoor Bill

- We “will not —**for now**—call for legislation requiring companies to decode messages for law enforcement.”
- But…

Obama: No Backdoor Bill

- We “will not —**for now**—call for legislation requiring companies to decode messages for law enforcement.”
- But…
  - Leaked National Security Council memo from Thanksgiving 2015

The Rule of Cynicism

- Bob Litt, General Counsel of the ODNI:

  Encryption debate “could turn in the event of a terrorist attack or criminal event where strong encryption can be shown to have hindered law enforcement.”

All Writs Act Litigation

- Apple v. FBI

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  - This is the San Bernardino iPhone case

All Writs Act Litigation

- Apple v. FBI
  - This is the San Bernardino iPhone case
  - Also, a case in EDNY

Other Litigation

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  - EFF just this quarter filed a FOIA case to get access to them

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- Not just e2e and FDE
  - This would outlaw computers as we know them

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  - Unconstitutional
  - Would break the Internet
  - Would cripple American business
  - Would be totally ineffective!

2016

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2016

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  - Key escrow mandate
    - I don’t think this is actually going to happen.
  - Burr-Feinstein
    - This definitely won’t happen (in the current form)
  - We don’t care how, just make plaintext available.
    - Now I will go into prediction mode.

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2016

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  - No ban will reach FOSS crypto
  - CALEA-like mandate
  - India/Australia/UK may do dumb things

It’s an election year…

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- Trump
  - "Apple ought to give the security for that phone, OK. What I think you ought to do is boycott Apple until such a time as they give that security number. How do you like that? I just thought of it. Boycott Apple."

It’s an election year…

- Clinton
  - "It doesn't do anybody any good if terrorists can move toward encrypted communication that no law enforcement agency can break into before or after. There must be some way."

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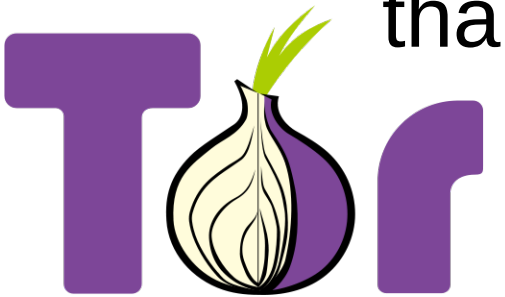

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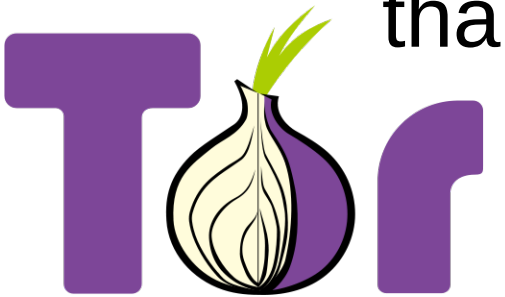

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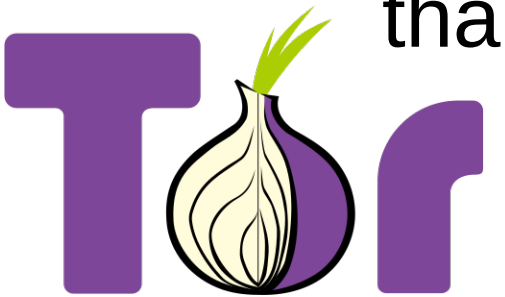

Questions?

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